

# REMEDIAL INVESTIGATION AND FEASIBILITY STUDY PLANS FOR LOW PRIORITY SITES

VOLUME III  
HEALTH AND SAFETY PLAN

U.S. DEPARTMENT OF ENERGY  
ROCKY FLATS PLANT  
GOLDEN, COLORADO

JUNE 1, 1988



ROCKWELL INTERNATIONAL  
AEROSPACE OPERATIONS  
ROCKY FLATS PLANT

DRAFT

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Low Priority Sites RIFS Plans  
Rocky Flats Plant DRAFT

June 1, 1988

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## **1. INTRODUCTION**

CEARP uses a three-tiered approach in the preparation of monitoring plans the CEARP Generic Monitoring Plan (CGMP), the Installation Generic Monitoring Plan (IGMP), and the Site-Specific Monitoring Plans (SSMPs) This IGMP is the Comprehensive Source and Plume Characterization Plan required by the compliance agreement Therefore, the acronym used to refer to this plan is IGMP/CSPCP

This IGMP/CSPCP Health and Safety Plan incorporates the specific safety practices and procedural review requirements for Rocky Flats Plant

The CGMP Health and Safety Plan provides generic guidance and establishes procedures for conducting site characterization (remedial investigation) activities under CEARP Phase 2 It outlines how the DOE-Albuquerque Operations Office will implement health and safety requirements under CEARP Specifically, it provides generic guidelines and procedures that will be employed by Rocky Flats Plant and Los Alamos National Laboratory during CEARP Phase 2b site characterization (remedial investigation) activities to protect the health and safety of personnel involved in CEARP Thus, the CGMP Health and Safety Plan becomes the foundation for the Rocky Flats Plant IGMP/CSPCP Health and Safety Plan and is incorporated, as appropriate, by reference

## **2. POLICY AND STANDARDS**

It is DOE's policy that its operations shall be conducted in a manner that will (1) limit risks to the health and safety of the public and employees, and (2) adequately protect property and the environment. As outlined in the CGMP Health and Safety Plan, DOE has responsibility for health, safety, and environmental protection programs at DOE-owned contractor-operated facilities. Consistent with this responsibility, this Health and Safety Plan includes the current health and safety policy and standards in effect at Rocky Flats Plant. It also includes provisions to implement external subcontractor policy and standards when the latter are determined to be more restrictive.

### **2.1. POLICY**

The main tenet of this IGMP/CSPCP Health and Safety Plan is to keep human exposure to toxic materials and radiation at levels as low as reasonably achievable (ALARA). The ALARA review will demonstrate that all reasonable efforts have been made to minimize worker and public exposures to toxic and/or radioactive materials.

Specific ALARA procedures will include engineering controls, administrative controls, and the use of personal protective equipment. The length of time employees spend in areas with elevated levels of radioactive or toxic materials will be minimized. If conditions produce airborne contaminants, dust suppressant measures will be taken. General requirements for limiting exposures, and protective clothing and equipment necessary to protect personnel from contaminants are identified in the CGMP Health and Safety Plan and are specifically addressed in this IGMP/CSPCP Health and Safety Plan, Section 4.2.

## **2.2 STANDARDS AND REGULATIONS**

The environmental, safety, and health protection requirements applicable to Rocky Flats Plant operations are set forth in DOE and DOE-Albuquerque Operations Office Orders. These orders require compliance with applicable Federal, State of Colorado, or local standards. This Rocky Flats Plant IGMP/CSPCP Health and Safety Plan is based on these DOE Orders, Federal regulations, and other professional standards specified in Section 2 of the CGMP Health and Safety Plan.

## **2.3. PLANT PERMITS AND SUPPORTIVE DEPARTMENTS**

Various permits are required at the Rocky Flats Plant in order to properly control activities and personnel within the Plant. The permits are administered through different internal Plant departments. Construction Management distributed land use and work activity permits (e.g., work, welding, excavation, samples, and entry) for approvals. Plant security must be contracted for firing range access permits, escorts, and justification for entry into secured areas.

Supportive functions provided by other departments are dependent upon the type of field activity being implemented. For examples of specific supportive requirements, see the Job Safety Analysis (JSA) in the SSMP (Appendix 1).

The CEARP Health and Safety Coordinator is responsible for coordinating with the various departments for permits, escorts, justifications for entries, and the supportive functions when notified by the CEARP Project Manager or the Subcontractor Site Manager.

### **3. HEALTH AND SAFETY RESPONSIBILITIES**

The line organizations conducting CEARP Phase 2b Site Characterizations (Remedial Investigations) are responsible for providing adequate precautions and protection to ensure the health and safety of employees and the public. The simplified organizational chart for health and safety at Rocky Flats Plant is presented in Figure 3.1

#### **3.1. GENERAL RESPONSIBILITIES**

For site characterization (remedial investigation) activities conducted at Rocky Flats Plant, the Rockwell International CEARP Manager establishes requirements following guidelines specified in this IGMP/CSPCP Health and Safety Plan that are consistent with current health and safety requirements. The Rockwell CEARP Health and Safety Coordinator and the Subcontractor Site Health and Safety Coordinator are responsible for ensuring the health and safety of field team personnel during CEARP Phase 2b site characterization (remedial investigation) activities. The CEARP Health and Safety Coordinator and Subcontractor Site Health and Safety Coordinator provide guidance to the CEARP Manager and the Subcontractor Site Manager regarding potential health hazards during characterization activities. The CEARP Health and Safety Coordinator and the Subcontractor Site Health and Safety Coordinator have the authority to terminate field activities at specific sites if unsafe conditions develop. Any such termination of field activities will recommence only after the Rockwell International CEARP Health and Safety Coordinator authorizes such a restart.



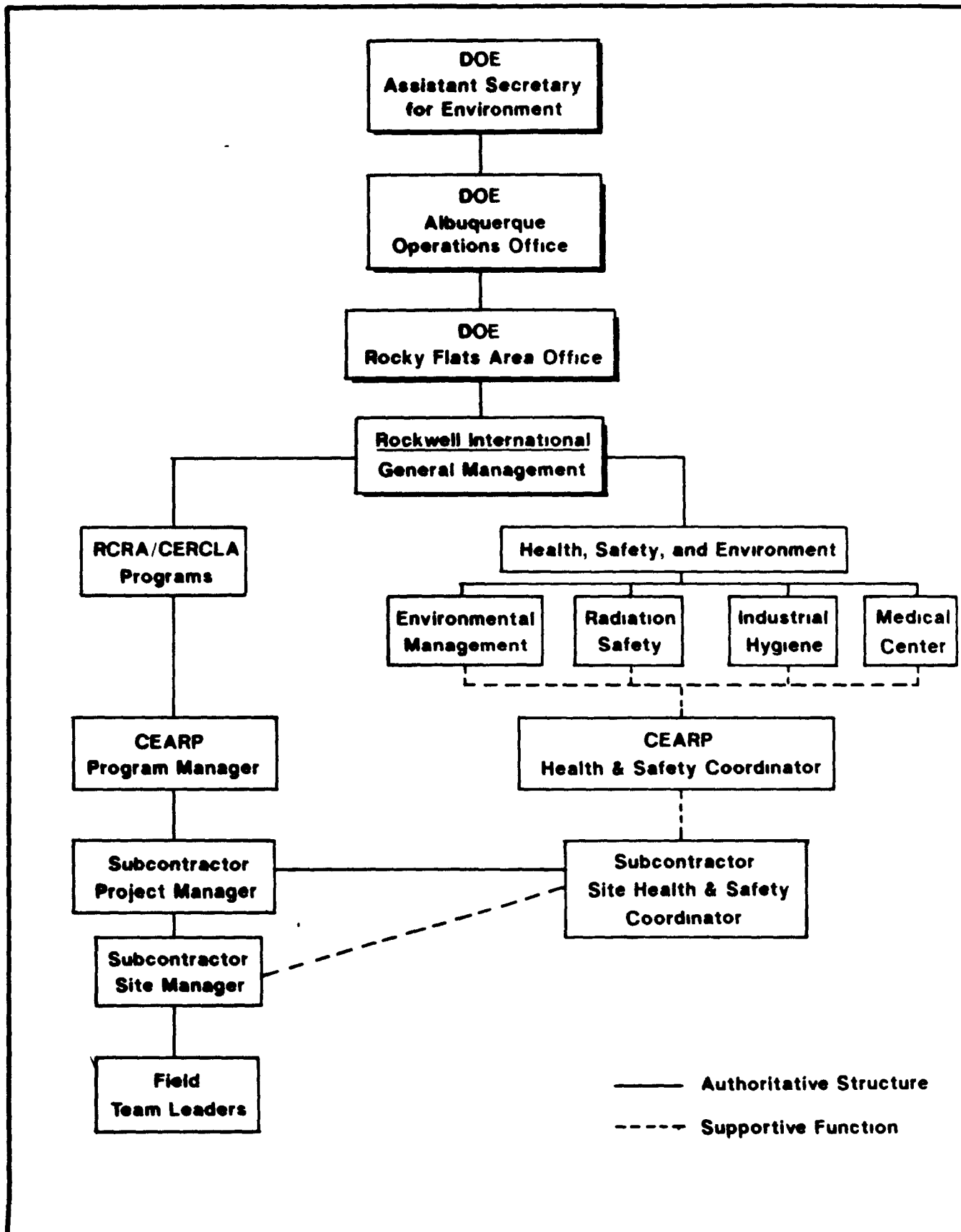


Figure 3-1

### **3.2. INSTALLATION REQUIREMENTS**

Primary health and safety responsibility at Rocky Flats Plant rests with Rockwell International Health, Safety and Environmental Department Director. The Rockwell International CEARP Health and Safety Coordinator, along with representatives of the Rockwell International Health, Safety, and Environment Department, under direction of the Rockwell International CEARP Manager, will review and concur with the SSMP Health and Safety Plans prior to commencement of site characterizations (remedial investigations). The Rockwell International Health, Safety, and Environment Department will also provide guidance to the CEARP Health and Safety Coordinator for establishing requirements protective of health and safety and environment.

### **3.3. SPECIFIC RESPONSIBILITIES**

Specific responsibilities assigned to the functional health and safety organization for the Rocky Flats Plant CEARP Phase 2b site characterizations (remedial investigations) are provided in the following sections:

#### **3.3.1 Los Alamos National Laboratory**

Because the site characterizations (remedial investigations) will be conducted by Rockwell International, Los Alamos National Laboratory does not have responsibility for implementing Health and Safety Plans.

### **3 3 2 Rockwell International CEARP Manager**

The Rockwell International CEARP Manager shall

- ensure that the Rocky Flats Plant SSMP Health and Safety Plans are prepared, reviewed, and concurred with by the appropriate individuals within DOE-Albuquerque Operations Office and Rocky Flats Plant,
- concur in the selection of the Subcontractor Site Manager and Subcontractor Site Health and Safety Coordinator,
- ensure that personnel involved with CEARP Phase 2b site characterizations (remedial investigations) comply with the IGMP/CSPCP Health and Safety Plans,
- require periodic health and safety audits (at least once during each stage of sampling), review Health and Safety Audit Reports, and require responses to Health and Safety Audit Report findings and recommendations,
- act on employee concerns in accordance with the procedures outlined in DOE Orders and take appropriate action to correct violations,
- review and evaluate requests for variance from the Health and Safety plans, and
- ensure that the proper reports required by DOE and DOE-Albuquerque Operations Office orders are submitted, including accident investigation reports, as necessary

### **3 3 2 1 Rockwell International CEARP Health and Safety Coordinator**

The Rockwell International CEARP Health and Safety Coordinator shall

- coordinate with all necessary internal Rocky Flats department representatives to ensure the implementation of the IGMP/CSPCP Health and Safety Plans,
- conduct periodic Health and Safety audits, make recommendations and assures implementation of those recommendations,
- reviews and evaluates variance requests to the Health and Safety plans,
- conducts sampling, analysis and data reduction for toxic materials and exposure assessment, and
- establishes and verifies work procedures dealing with toxic substances

### **3 3 3 Subcontractor Project Manager**

The Subcontractor Project Manager shall

- assign a Subcontractor Site Manager (Section 3 3 4) who will be responsible for ensuring the health and safety of field team personnel during CEARP Phase 2b Site Characterization (Remedial Investigation) activities,
- assign a Subcontractor Site Health and Safety Coordinator (Section 3 3 5) to ensure implementation of the Rocky Flats Plant IGMP/CSPCP Health and Safety Plan and each SSMP Health and Safety Plan, and
- read, concur, and comply with the Rocky Flats Plant IGMP/CSPCP Health and Safety Plan

### **3 3 4 Subcontractor Site Manager**

The Subcontractor Site Manager shall

- submit requests for variance from the requirements of this plan to the Subcontractor Project Manager and Rockwell International CEARP Health and Safety Coordinator, when appropriate,
- assure that requirements specified in DOE and DOE-Albuquerque Operations Office Orders 54841 are recorded and reported for all employees,
- ensure that personnel involved with CEARP Phase 2b site characterizations (remedial investigations) comply with the IGMP/CSPCP Health and Safety Plans,
- monitor the performance of employees involved in site characterization (remedial investigation) activities to ensure compliance with health and safety requirements,
- be familiar with emergency response procedures and notification requirements, and implement them accordingly, and
- terminate work activities if unsafe conditions develop or when directed to do so by the Subcontractor Site Health and Safety Coordinator or CEARP Health and Safety Coordinator

### **3 3 5 Subcontractor Site Health and Safety Coordinator**

A Subcontractor Site Health and Safety Coordinator will be designated by the Subcontractor Project Manager for each stage of the Phase 2b site characterization (remedial investigation) activities. The Rockwell International CEARP Manager shall concur in the selection of the Subcontractor Site Health and Safety Coordinator. The Subcontractor Site Health and Safety Coordinator is responsible for conducting a review of the proposed activities prior to commencement of operations, evaluating potential hazards, and recording the appropriate information on a Work Location, Personnel Protection, and Safety Evaluation Form (Appendix A). Activities that require special monitoring or certain personal protective equipment will be specified in the SSMP Health and Safety Plans. In addition to the duties outlined in Section 3.4 of the CGMP Health and Safety Plan, specific responsibilities of the Subcontractor Site Health and Safety Coordinator include the following:

- being present or having an acceptable alternate present when subcontractor work activities are being performed in areas requiring decontamination of personnel or equipment,
- advising the Rockwell International CEARP Manager, the CEARP Health and Safety Coordinator, and the Subcontractor Site Manager of potential health and safety hazards during site characterization (remedial investigation) activities,
- conduct special monitoring, if necessary,
- evaluate potential modifications to work plans and personal protective equipment requirements to ensure employee safety,
- ensure that site characterization (remedial investigation) team members have been trained in the appropriate safety procedures for the activities they will conduct, have current medical certification that they are physically fit to perform required tasks, and have participated in all required dosimetry or bioassay training programs,
- contact the appropriate local emergency organizations (police, fire, ambulance, and hospital) to coordinate emergency response activities,

- require that the Subcontractor Field Team Leader terminate work activities if unsafe conditions develop, or an imminent hazard is perceived,
- prepare variances from the health and safety requirements if needed, and
- acquisition, calibration and maintenance of radiation and air monitoring instruments used by Subcontractor personnel

### 3.4 AUDITS

Health and safety audits will be conducted by the CEARP Health and Safety Coordinator to ensure adequate implementation of the requirements of this IGMP/CSPCP Health and Safety Plan. The Los Alamos National Laboratory CEARP Team Leader and the Rockwell International CEARP Manager will receive copies of these audits. Individuals responsible for health and safety deficiencies noted in the audit findings will provide written responses describing corrective actions that have been implemented to resolve the findings.

The Rockwell International Health, Safety, and Environment Department may also conduct health and safety audits, separately or concurrently, with subcontractor's corporate health and safety audits. The Los Alamos National Laboratory CEARP Team Leader and the Rockwell International CEARP Manager will receive copies of these audits. Individuals responsible for health and safety deficiencies noted in the audit findings will provide written responses describing corrective actions that have been implemented to resolve the findings.

### **3.5. VARIANCES FROM HEALTH AND SAFETY REQUIREMENTS**

Where special conditions exist, a written request for a variance from a specific health and safety requirement may be submitted by the Subcontractor Site Health and Safety Coordinator to the Subcontractor Project Manager. If the Subcontractor Project Manager agrees with the request, the request will be forwarded to the CEARP Health and Safety Coordinator followed by a review by the Rockwell International CEARP Manager. The conditions of the request will be evaluated and, if appropriate, a variance specifying the conditions under which the requirement may be modified will be granted in writing by the Rockwell International CEARP Manager. A copy of the variance will be retained in the field during work activities in which it is invoked.

For timely implementation of variances during field activities, a verbal variance request may be made by the Subcontractor Site Manager through the Subcontractor Site Health and Safety Coordinator to the CEARP Health and Safety Coordinator. All such verbal requests for variance will be submitted in written form by the Subcontractor Site Health and Safety Coordinator to the CEARP Health and Safety Coordinator and CEARP Manager within five working days following the verbal request.

#### **4. HAZARD ASSESSMENT AND PERSONNEL PROTECTION REQUIREMENTS**

The following section provides a description of anticipated potential hazards anticipated at Rocky Flats Plant. The hazards description includes physical, chemical, radiological and biological hazards, followed by general requirements for limiting exposures, monitoring contaminant concentrations, and measuring employee exposure.

##### **4.1. IDENTIFICATION OF POTENTIAL HAZARDS**

###### **4.1.1 Physical Hazards**

The following physical hazards are anticipated at Rocky Flats Plant:

###### **Heat Stress**

The body's physiological processes fail to maintain a normal body temperature because of excessive heat. A number of physical reactions can occur, ranging from mild to fatal.

###### **Heat-Related Problems**

- Heat Rash, caused by continuous exposure to heat and humid air aggravated by chafing clothes. Decreases ability to tolerate heat and becomes a nuisance.
- Heat Cramps, caused by profuse perspiration with inadequate fluid intake and chemical replacements (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.
- Heat exhaustion, caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing, pale, cool, moist skin, profuse sweating, dizziness and lassitude.
- Heat stroke, the most severe form of heat stress. Body must be cooled immediately to prevent severe injury and/or death. Signs: red, hot, dry skin, no perspiration, nausea, dizziness and confusion, strong rapid pulse, coma.



### Work/Rest Schedule

When working in level B or C protective clothing, the following guideline for calculating the work/rest schedule shall be used

Calculate the adjusted temperature,

$$T(\text{adjusted}) = T(\text{actual}) + (13 \times \text{sunshine fraction})$$

100% sunshine =	no cloud cover	= 1 0
50% sunshine =	50% cloud cover	= 0 5
0% sunshine =	full cloud cover	= 0 0

Adjusted Temperature	Active Work Time (min /hr)
75 or less	50
80	40
85	30
90	20
95	10
100	0

### Cold Exposure

Persons working outdoors in temperatures at or below freezing can become frostbitten. Exposure to extreme cold for short time periods can cause severe injury to the body surface or can result in profound generalized cooling, causing death. Body areas which have high surface-area-to-volume ratios (e.g., fingers, toes, and ears) are the most susceptible.

### Cold Exposure-Related Problems

- Frost nip or incipient frostbite, characterized by sudden blanching or whitening of skin
- Superficial frost bite, which causes skin to become waxy or white and superficially firm, but resilient beneath

- Deep frostbite, characterized by cold, pale, solid skin tissues
- Systemic hypothermia, caused by exposure to freezing or rapidly dropping temperature. Symptoms are usually exhibited in five stages: 1) shivering, 2) apathy, listlessness, sleepiness and (sometimes) rapid cooling of the body to less than 95°F, 3) unconsciousness, glassy stare, slow pulse and slow respiratory rate, 4) freezing of the extremities, and finally, 5) death

Caution will be used to prevent cold exposure by wearing properly insulated garments beneath protective clothing and by taking frequent warm-up breaks

### Noise

When noise exceeds acceptable levels (limits specified in Department of Air Force Regulation 161-35 TLV's) administrative or engineering controls designed to reduce exposures will be utilized. If these controls are not sufficient, approved ear protection will be provided and its use mandated. Noise levels will be monitored when it becomes necessary to speak loudly under normal working conditions.

### Standard Precautions for Equipment and Structures

Site characterizations (remedial investigations) at Rocky Flats Plant may require the use of shovels, drill rigs, portable augers, and backhoes. Prior to any surface disturbance the required permit will be obtained from Rocky Flats Plant. Heavy equipment will be operated according to OSHA recommendations and requirements.

- Only qualified and licensed personnel shall be allowed to operate this equipment
- Heavy equipment shall be operated and maintained in conformance with established standards and inspected prior to use, as directed by Federal, State or OSHA regulations

- Overhead electrical power lines shall be considered energized unless Rocky Flats Plant Utilities Manager has verified de-energization
- While in use, drilling rigs shall maintain the following minimum distances from overhead power lines 10 ft for 50 kv, 20 ft for 345 kv, and 34 ft for 750 kv

In transit, with the boom or derrick lowered, the closest approach to a powerline shall be 4 ft for 50 kv, 10 ft for 50-345 kv, and 16 ft for 345-750 kv

#### **Flammable and/or Combustible Materials**

Several sites requiring characterization could contain flammable or combustible materials. The SSMP Health and Safety Plans will contain detailed information on the likelihood of encountering combustible materials and specific health and safety requirements for these areas.

#### **4.1.2 Known Chemical Hazards**

Known chemical hazards at Rocky Flats Plant include possible inhalation, ingestion, or dermal absorption of organic compounds, solvents, or other toxic materials. Specific properties of known chemical contaminants are provided in Appendix A. If it is determined that additional chemicals are present at Rocky Flats Plant, Appendix A will be amended. Levels or concentrations of these hazardous materials can be estimated from groundwater sampling results.

#### **4.1.3 Known Radiological Hazards**

Radionuclides are expected to be present at Rocky Flats Plant. The specific properties of the known radionuclides, including type of emission, half-life, maximum allowable concentrations, and body burdens are provided in Appendix A. The spe-

cific properties of the known radionuclides including type of emission, half-life, maximum allowable concentrations, and body burdens are provided in Appendix A

There are three principal pathways by which individuals could be exposed to radioactivity during site characterizations (remedial investigations) These are (1) inhalation or ingestion, (2) dermal absorption, and (3) exposure to direct radiation from contaminated materials (see 4.2 for personnel protection requirements)

#### **4.1.4 Biological Hazards**

Certain biological hazards are anticipated at Rocky Flats Plant

- insects, including ticks and mosquitoes,
- snakes of poisonous and nonpoisonous species, and
- rodents, including mice and rats

If a worker is bitten by a rodent or snake, the Subcontractor Site Health and Safety Coordinator will be immediately notified The Rocky Flats Plant installation medical center shall be contacted and appropriate medical care given

### **4.2. PERSONNEL PROTECTION REQUIREMENTS**

#### **4.2.1 Protection Levels and Protective Clothing**

As stated in the CGMP Health and Safety Plan, the U.S. Environmental Protection Agency (EPA) has established four levels of protection for personnel entering potentially hazardous sites The work at Rocky Flats Plant is anticipated to be conducted in levels B, C, and D protection based upon known hazards The SSMP Health

and Safety Plan will define zones of contamination and identify which levels of protection will be required for each zone. All personnel entering a zone will be required to wear the attire designated for that zone.

#### **4.2.2 Protective Equipment**

As stated in the CGMP Health and Safety Plan, a variety of safety equipment will be used to protect personnel from safety hazards and minimize exposures to hazardous chemicals and radionuclides during Rocky Flats Plant site characterizations (remedial investigations). Portable monitors and meters will be used to determine exposures and measure air concentrations of radiological and chemical contaminants. The safety equipment used will include photoionization and organic vapor analyzers, air samplers, radiation survey meters, explosive gas concentration meters, detector tubes, and thermoluminescent dosimeters. This safety equipment is fully described in the CGMP Health and Safety Plan. The SSMP Health and Safety Plans will outline specific equipment to be used, and action levels to be taken for each type of measurement.

Cooling vests and warming equipment will be available to minimize stress from climatic conditions. As outlined in the CGMP Health and Safety Plan, emergency equipment including fire extinguishers, first aid kits, blankets, and eye wash kits will be available for emergency treatment.

#### **4 2 3 General Safety Practices and Mitigation Measures**

As stated in the CGMP Health and Safety Plan, some hazards can be minimized through the implementation of specific procedures, use of special equipment, training of personnel, or availability of emergency response equipment in the event of an accident. The general requirements listed in the CGMP Health and Safety Plan will be observed during all Rocky Flats Plant site characterizations (remedial investigations)

Work that may involve resuspension of contaminants into the air will be temporarily shut down when the wind speed exceeds 15 miles per hour

Morning meetings for all personnel involved in sampling will be held daily. These meetings will be used to express health and safety concerns related to the day's activities. Standard safe working practices, described in Section 4 of the CGMP Health and Safety Plan, will be followed. Appendix A provides a list of potential chemical and hazards radiological and their respective method of detection and Threshold Limit Value (TLV). A detailed description of hazards and hazardous materials which could be encountered at each site will be provided in each SSMP Health and Safety Plan. The SSMP Health and Safety Plans will also provide site-specific safety practices and mitigative measures.

### **4.3. SITE ACCESS CONTROL**

#### **4 3 1 Restricted Access Zones**

As stated in the CGMP Health and Safety Plan, control zones will be established prior to commencement of work at contaminated sites to protect employees and

the general public from unnecessary exposure to toxic materials and/or radiation, and to prevent inadvertent spread of contamination. The control (exclusion) zones will be designated in each SSMP Health and Safety Plan based on the nature, magnitude, and extent of contamination, and the potential for contaminant migration. Decontamination is required for personnel, equipment, and vehicles moving from an exclusion zone to a clean zone.

The decontamination of equipment and personnel will be conducted in steps starting at exclusion zones, proceeding through contamination reduction zones, and ending at clean zones. The size and number of contamination reduction zones will be determined on a site-specific basis and will be provided in each SSMP Health and Safety Plan. Exclusion criteria, protection requirements, contact person, and other relevant information will be posted at the access station of each exclusion zone.

#### **4.3.2 Decontamination**

At Rocky Flats Plant, decontamination will follow the general procedures described in Section 4 of the CGMP Health and Safety Plan. Each SSMP Health and Safety Plan will clearly define decontamination procedures for specific contaminants of concern.

Decontamination solutions used will be selected according to contaminants encountered on a site-specific basis. Radionuclides anticipated at Rocky Flats Plant can be removed from personnel and equipment using dilute soap and water solutions. Organic compounds and solvents will require use of slightly stronger detergents for effective removal. Following decontamination, verification measurements will be made to ensure that contaminants have been removed to safe levels. For articles or person-

nel contaminated by low energy beta emitters, swipe-samples will be collected and analyzed using liquid scintillation detectors. For alpha and high energy beta emitters, a survey meter will be used to evaluate decontamination. Following this "frisking," swipes will be collected and analyzed using a gross alpha/beta counting meter.

#### **4.4. WORKER TRAINING**

As described in the CGMP Health and Safety Plan, health and safety training will be conducted and documented for all members of site characterization (remedial investigation) field teams. The level of training for each team will be commensurate with job functions and potential hazards in work areas. Additionally, all team members will have received training that complies with OSHA Standard 29CFR 1910.120. This will be in addition to completion of any subcontractor basic health and safety training, or the equivalent, that must be approved prior to site assignment. At least two field members of each field team will be required to have current certification in American Red Cross Multi-Media First Aid and Cardio Pulmonary Resuscitation (or the equivalent). In addition, training for all field team members will meet right-to-know requirements and will follow the outline in Appendix A, which includes

- radiological safety,
- hazard identification and recognition,
- potential health effects and symptoms of exposure,
- protective equipment requirements and proper use,
- decontamination procedures,
- controlled area restrictions, and
- emergency response requirements



#### **4.5. EMPLOYEE MEDICAL PROGRAM**

As stated in the CGMP Health and Safety Plan, site characterization (remedial investigation), subcontractor field team members shall participate in an employee medical examination program. Their suitability for conducting field sampling activities (including possible respirator use) will be evaluated and documented by a physician. Medical programs must comply with requirements of DOE Order 5480.1A Chapter VIII and OSHA Standard 29CFR 1910.120.

#### **4.6. RECORDS AND REPORTING REQUIREMENTS**

Subcontractors will maintain health and safety records and submit reports, as required by DOE Orders, to the Subcontractor CEARP Project Manager. These will include the following:

- DOE Form 5484.3 Supplementary Record of Occupational Injuries and Illnesses
- DOE Form 5484.4 Tabulation of Property Damage Experience
- DOE Form 5485.5 Report of Property Damage or Loss
- DOE Form 5484.6 Annual Summary of Whole Body Exposures to Ionizing Radiation
- DOE Form 5484.7 Summary of Exposures Resulting in Internal Body Depositions of Radioactive Materials for CY
- DOE Form 5484.8 Termination Occupational Exposure Report
- DOE Form OSHA-200 Log of Occupational Injuries and Illness
- DOE Form EV-102A Summary of Department of Energy and Department of Energy Contractor Occupational Injuries and Illnesses
- DOE Form 5821.1 Unplanned Releases Form

The Subcontractor Project Manager will distribute copies of the reports to Los Alamos National Laboratory, the DOE-Albuquerque Operations Office, and the Rockwell International Health and Safety Department, as appropriate. Specific reporting responsibilities are given in the following subsection.

#### **4.6.1 Exposure and Medical Records**

Subcontractors will maintain confidential medical records for each field team member as indicated by the employee medical program. These records will identify individuals by name, date of birth, social security number, and additional identifiers as desired by the subcontractor. The employee's accident record and history of exposures and/or possible exposures to hazardous physical, chemical, or biological agents will be included with the medical records.

The Subcontractor Site Health and Safety Coordinator will prepare, and submit to the Subcontractor Project Manager and the Rockwell International CEARP Manager, radiation exposure reports as required in DOE Order 5484.1. Form 5484.8, "Termination Occupational Exposure Report," will be completed for any employee included in a radiation monitoring program upon termination of employment. Forms 5484.7, "Summary of Exposures Resulting in Internal Body Depositions of Radioactive Materials for CY 19XX," and 5484.6, "Annual Summary of Whole Body Exposures to Ionizing Radiation," will be submitted annually by March 31 for monitored employees. These reporting requirements are currently under revision by DOE, and the Subcontractor Site Health and Safety Coordinator shall comply with the new requirements when they become final.

#### 462 Accident/Incident Reports

The Subcontractor Site Health and Safety Coordinator will notify the Subcontractor Project Manager and the Rockwell International CEARP Manager of any accidents or incidents that occur during site characterizations (remedial investigations) at Rocky Flats Plant. The Subcontractor Site Health and Safety Coordinator will also submit a completed DOE Form F 5484 X for any of the following incidents

- (1) "Recordable" occupational injuries or illnesses are defined below

OCCUPATIONAL INJURY is any injury such as a cut, fracture, sprain, or amputation that results from a work accident or from an exposure involving a single incident in the work environment. NOTE: Conditions resulting from animal or insect bites, or one-time exposure to chemicals, are considered to be injuries.

OCCUPATIONAL ILLNESS of an employee is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact with a toxic material.

- (2) PROPERTY DAMAGE LOSSES of \$1,000 or more are reported as follows: accidents which cause damage to DOE property, regardless of fault, or accidents wherein DOE may be liable for damage to a second party, are reportable if damage is \$1,000 or more. Include damage to facilities, inventories, equipment, and properly parked motor vehicles. Exclude damage resulting from a DOE reportable vehicle accident.
- (3) GOVERNMENT MOTOR VEHICLE ACCIDENTS resulting in damages of \$250 or more, or involving an injury, are reported unless the Government vehicle is not at fault, damage of less than \$250 is sustained by the Government vehicle, and no injury is inflicted on the Government vehicle occupants. Accidents are also reportable to DOE if
- damage to a Government vehicle, not properly parked, is greater than or equal to \$250,
  - damage to DOE property is greater than or equal to \$250 and the driver of a Government vehicle is at fault,

- damage to any private property or vehicle is greater than or equal to \$250 and the driver of a Government vehicle is at fault, and
- any person is injured and the driver of a Government vehicle is at fault

## **5. EMERGENCY RESPONSE AND NOTIFICATION**

This section provides guidelines for responses to emergency situations

### **5.1. EMERGENCY CONTACTS**

Names of persons to contact in case of emergencies will be provided in the format found in Figure 5.1. This emergency contact form will be copied and posted in prominent locations at the work sites. Additional contacts are given in the Safety Evaluation Form (Appendix A).

### **5.2. CONTINGENCY PLANS**

Field team leaders, with assistance from the Subcontractor Site Health and Safety Coordinator, shall have responsibility and authority for coordinating all emergency response activities until proper authorities arrive and assume control. A copy of these plans shall be available at the work site at all times, and all personnel working on the site shall be familiar with the plans. Evacuation plans and routes shall be on a job-specific basis, and all personnel shall be familiar with them.

#### **5.2.1 Fire/Explosion**

Any fire emergency will be handled by immediately notifying the fire department. Only if the fire appears to be small and easily extinguishable will personnel attempt control with fire extinguishers available in the work area. Otherwise, immediate evacuation of the area is indicated.

If combustible gas/oxygen meters show explosive gas or oxygen concentrations approaching 25% of the lower explosive limits, all personnel will be evacuated and the fire department will be notified. In the event of an explosion, all personnel shall be evacuated and no one shall re-enter the area until it has been cleared by explosives safety personnel.

#### **5.2.2 Personnel Injuries**

In case of injuries to personnel, first aid treatment will be initiated immediately by trained personnel. In case of serious injuries, the victim will be transported to the Rocky Flats Plant medical center as soon as possible. Minor injuries may be treated onsite, but all injuries will be examined by trained medical personnel. Victims of serious bites or stings will be taken to the Rocky Flats Plant medical center. In the event that an injured person is contaminated with chemicals or radionuclides, the person shall be taken as soon as possible to the Rocky Flats Plant medical center. Decontamination shall be performed to prevent further exposure only if it will not aggravate the injury. Treatment of life threatening or serious injuries will always be considered first.

#### **5.2.3 Accidental Releases of Radionuclides to the Environment**

In case of releases of radionuclides to the environment (such as a spill of samples being transported for analysis), emergency response shall be in accordance with Rocky Flats Plant procedures. The Subcontractor Site Manager or Field Team Leader shall notify the Rockwell International CEARP Manager of such an event.

### **5.3. NOTIFICATION REQUIREMENTS**

Reporting and notification of emergency situations shall be carried out in accordance with requirements in DOE Order 5484.1. The Field Team Leader will notify appropriate emergency assistance personnel (e.g., fire, police, ambulance at ext. 2911) immediately, and then notify the Subcontractor Site Manager. The Subcontractor Site Manager will notify the Rockwell International CEARP Manager. The responsibility of the Subcontractor Site Health and Safety Coordinator for Rocky Flats Plant is to implement notification and reporting requirements of DOE Order 5484.1.

## **6. ENVIRONMENTAL MONITORING**

Environmental impacts from CEARP site characterizations (remedial investigations) are expected to be negligible. Additional sampling to supplement Rocky Flats Plant routine monitoring activities is not considered necessary. Monitoring of air quality for personnel protection will provide data to re-evaluate the need for environmental monitoring. Additional guidance and detail regarding monitoring during site characterizations (remedial investigations) will be provided in SSMP Sampling Plans.



## **APPENDIX A**

- A-1 Rocky Flats Plant Safety Evaluation Form**
- A-2 Chemical Hazards of Concern**
- A-3 Radiological Hazards of Concern**
- A-4 Health and Safety Training Outline**

WORK LOCATION PERSONNEL PROTECTION  
AND SAFETY EVALUATION FORM

Attach Pertinent Documents/Data

Fill in Blanks \_\_\_\_\_

WO # \_\_\_\_\_

Reviewed by \_\_\_\_\_

Division \_\_\_\_\_

Date \_\_\_\_\_

Office \_\_\_\_\_

Approved by \_\_\_\_\_

Prepared by \_\_\_\_\_

Date \_\_\_\_\_

Date \_\_\_\_\_

**A. Work Location Description**

1. Name \_\_\_\_\_

2. Location \_\_\_\_\_

3. Type: HW Site ( )

Industrial ( )

Spill ( )

Construction ( )

( ) Existing work Location

Other ( ) Describe \_\_\_\_\_

4. Status \_\_\_\_\_

5. Anticipated activities: \_\_\_\_\_

6. Size \_\_\_\_\_

7. Surrounding Population \_\_\_\_\_

8. Buildings/Homes/Industry \_\_\_\_\_

9. Topography \_\_\_\_\_

10. Anticipated Weather\_\_\_\_\_

11. Unusual Features\_\_\_\_\_

12. Site History\_\_\_\_\_

**B. Hazard Description**

1. Background Review: Complete ( ) Partial ( )

If partial, why?\_\_\_\_\_

2. Hazard Levels:\* A ( ) B ( )

Unknown ( ) C ( ) D ( )

Justification\_\_\_\_\_

3. Types of Hazards: (Attach additional sheets as necessary)

A. Chemical ( ) Inhalation ( ) Explosive ( )

Biological ( ) Ingestion ( ) O<sub>2</sub> Def. ( )

Skin Contact ( ) toxic ( )

Describe\_\_\_\_\_

B. Physical ( ) Cold Stress ( ) Noise ( )

Heat Stress ( ) Other ( )

Describe\_\_\_\_\_

C. Radiation ( )

Describe \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Nature of Hazards:

Air ( ) Describe \_\_\_\_\_  
\_\_\_\_\_

Soil ( ) Describe \_\_\_\_\_  
\_\_\_\_\_

Surface Water ( ) Describe \_\_\_\_\_  
\_\_\_\_\_

Ground Water ( ) Describe \_\_\_\_\_  
\_\_\_\_\_

Other ( ) Describe \_\_\_\_\_  
\_\_\_\_\_

5. Chemical Hazards of Concern

6. Radiological Hazards of Concern

7. Work Location Instrument Readings ( ) N/A

Location\_\_\_\_\_

% O<sub>2</sub>\_\_\_\_\_

Radioactivity\_\_\_\_\_

FID\_\_\_\_\_

Other\_\_\_\_\_

Location\_\_\_\_\_

% O<sub>2</sub>\_\_\_\_\_

Radioactivity\_\_\_\_\_

FID\_\_\_\_\_

Other\_\_\_\_\_

Location\_\_\_\_\_

% O<sub>2</sub>\_\_\_\_\_

Radioactivity\_\_\_\_\_

FID\_\_\_\_\_

Other\_\_\_\_\_

Location\_\_\_\_\_

% O<sub>2</sub>\_\_\_\_\_

Radioactivity\_\_\_\_\_

FID\_\_\_\_\_

Other\_\_\_\_\_

% LEL\_\_\_\_\_

PID\_\_\_\_\_

Other\_\_\_\_\_

Other\_\_\_\_\_

% LEL\_\_\_\_\_

PID\_\_\_\_\_

Other\_\_\_\_\_

Other\_\_\_\_\_

% LEL\_\_\_\_\_

PID\_\_\_\_\_

Other\_\_\_\_\_

Other\_\_\_\_\_

% LEL\_\_\_\_\_

PID\_\_\_\_\_

Other\_\_\_\_\_

Other\_\_\_\_\_

8. Hazards expected in preparation for work assignment.  
( ) N/A

Describe:\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

To be Completed For Site-Specific Health and Safety Plans

C. Personnel Protective Equipment

1. Level of Protection

To Be Completed For Site-Specific Health and Safety Plans

A ( ) B ( ) C ( ) D ( ) Location/Activity:

---

A ( ) B ( ) C ( ) D ( ) Location/Activity:

---

2. Protective Equipment (specify probable quantity required)

Respiratory ( ) N/A

Clothing ( ) N/A

( ) SCBA, Airline

( ) Fully Encapsulating Suit

( ) Full Face Respirator  
(Cart. \_\_\_\_\_)

( ) Chemically Resistant  
Splash Suit

( ) Apron, Specify \_\_\_\_\_

( ) Escape Mask

( ) Tyvek Coverall

( ) Saranex Coverall

( ) None

( ) Coverall, Specify \_\_\_\_\_

( ) Other \_\_\_\_\_

( ) Other \_\_\_\_\_

( ) Other \_\_\_\_\_

( ) Other \_\_\_\_\_

---

Head & Eye ( ) N/A

Hand Protection ( ) N/A

( ) Hard Hat

( ) Undergloves \_\_\_\_\_  
Type

( ) Goggles

( ) Gloves \_\_\_\_\_  
Type

( ) Face Shield

( ) Overgloves \_\_\_\_\_  
Type

( ) Chemical Eyeglasses

( ) None

( ) None

( ) Other \_\_\_\_\_

( ) Other \_\_\_\_\_

Foot Protection ( ) N/A

( ) Safety Boots

( ) Disposable Overboots

( ) Other \_\_\_\_\_

To Be Completed For Site-Specific Health and Safety Plans

3. Monitoring Equipment ( ) N/A

( ) CGI

( ) PID

( ) O<sub>2</sub> Meter

( ) FID

( ) Rad Survey

( ) Other \_\_\_\_\_

( ) Detector Tubes

Type: \_\_\_\_\_

( ) Other \_\_\_\_\_

D. Personnel Decontamination (Attach Diagram)

Required ( )

Not Required ( )

Equipment Decontamination (Attach Diagram)

Required ( )

Not Required ( )

If required, describe and list equipment \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E. Personnel

<u>Name</u>	<u>Work Location Title/Task</u>	<u>Medical Current</u>	<u>Fit Test Current</u>	<u>Certifi- cation Level</u>
1.		( )	( )	( )
2.		( )	( )	( )
3.		( )	( )	( )
4.		( )	( )	( )
5.	To Be Completed For	( )	( )	( )
6.	Site-Specific Health and	( )	( )	( )
7.	Safety Plans	( )	( )	( )
8.		( )	( )	( )
9.		( )	( )	( )
10.		( )	( )	( )

Site Safety Coordinator \_\_\_\_\_

F. Activities Covered Under This Plan

Task No.	Description	Preliminary Schedule
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## H. Contingency Contacts

<u>Agency</u>	<u>Contact</u>	<u>Phone Number</u>
Fire Department	_____	_____
Fire Department	_____	_____
Police Department	_____	_____
Health Department	_____	_____
Poison Control Center	_____	_____
State Environmental Agency	_____	_____
EPA-Regional Office	_____	_____
EPA-ERT. ICOM	_____	_____
Spill Contractor	_____	_____
State Police	_____	_____
F.A.A.	_____	_____
Civil Defense	_____	_____
Onsite Coordinator	_____	_____
Site Telephone	_____	_____
Nearest Telephone	_____	_____
	Location	

Other \_\_\_\_\_

## I. Contingency Plans

Spills, Accidental Release; Describe \_\_\_\_\_

Fire Explosion; Describe \_\_\_\_\_

Other; Describe \_\_\_\_\_

Exit Routes, Communication Systems; Describe\_\_\_\_\_

MEDICAL EMERGENCY

Name of Hospital\_\_\_\_\_

Address:\_\_\_\_\_ Phone No.\_\_\_\_\_

Name of Contact\_\_\_\_\_

Addresses:\_\_\_\_\_ Phone No.\_\_\_\_\_

Route to Hospital: (Attach Map)\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Travel Time Distance to  
From Site (Minutes)\_\_\_\_\_ Hospital (Miles)\_\_\_\_\_

Name/Number of 24-Hr. Ambulance Service\_\_\_\_\_

**HEALTH AND SAFETY PLAN  
APPROVAL/SIGN OFF FORMAT**

I have read, understood, and agreed with the information set forth in the Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing.

_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Site Safety Co-ordinator	_____ Signature	_____ Date
_____ Director, Corporate Health and Safety	_____ Signature	_____ Date
_____ Project Manager	_____ Signature	_____ Date
_____ Project Director/ Department Manager	_____ Signature	_____ Date
_____ Personnel Health and Safety Briefing Conducted By:		
_____ Name	_____ Signature	_____ Date

















## **Training Outline**

- I Training Purpose and Objectives**
- II Identification and Recognition of Health and Safety Hazards at the Rocky Flats Plant Facility**
  - A Physical Hazards**
    - o noise
    - o heat
    - o cold
    - o structures
  - B Chemical Hazards**
    - o volatile organics
    - o asbestos
    - o beryllium
  - C Radiological Hazards**
    - o plutonium
    - o americium
    - o tritium
    - o uranium
  - D Summary of Principal Hazards and Health Effects**
    - o chemical exposures
    - o external exposures to radionuclides
    - o internal exposures to radionuclides
    - o potential health effects for women and fetuses
- III Radiological Safety and Monitoring Requirements**
  - A Controlled Area Restrictions**
    - o eating/drinking
    - o smoking
    - o chewing
    - o access control points
  - B Protective Equipment Requirements**
    - o clothing hard hats, boots, gloves, coveralls
    - o respiratory protection
  - C Procedures for Using Protective Equipment**
    - o respiratory fit-test and use
    - o impermeable clothing

**D Personnel Contamination Monitoring and  
Decontamination**

**IV Emergency Response Requirements**

**A Locations and Methods of Accessing Emergency  
Assistance**

**B Emergency Notification Procedures**

**V Hazard Communication Information (Right-to-Know)**

**A List of Hazardous Materials**



